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ORGANIZATIONAL PROCESS AND COMBAT READINESS: FEASIBILITY OF TRAINING ORGANIZATIONAL EFFECTIVENESS STAFF OFFICERS TO ASSESS COMMAND GROUP PERFORMANCE

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observations so that improved performance would result. The results indicated that a positive relationship (correlation = .67) between organizational process performance and combat outcomes did exist, and also that it is possible to successfully train OESOs. Caution must be observed concerning these results since the sample sizes (twelve battalions and two OESOs) were very small. These results serve as a foundation for work to be accomplished in Phase II concerned with training command groups and battle staffs to improve their process performance and, thus, to enhance combat readiness.



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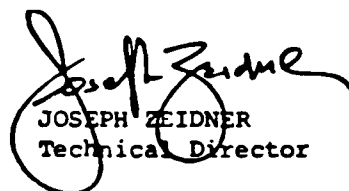
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FOREWORD

The Leadership and Management Technical Area of the U.S. Army Research Institute (ARI) is concerned with the development of concepts, techniques, and training that will enable the development of increased efficiency and effectiveness in Army organizational elements. One central focus of this work is the internal operation of battle staffs, and the extent to which their performance or organizational processes essential to battlefield outcomes can be improved. The research reported here applied a frame of reference based on systems theory to the observation and feedback of battle staff performance to the battle staff itself. It is a part of a larger effort to determine whether training in process performance will increase battalion combat readiness. The present work was accomplished under contract MDA903-78-C-2028 with the Human Resources Research Organization and is a part of Army Project 2Q162717A779.



JOSEPH ZEIDNER
Technical Director

ORGANIZATIONAL PROCESS AND COMBAT READINESS: FEASIBILITY OF
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BRIEF

This report describes the results of the first phase of a project concerned with research on the relationship between performance of certain critical organizational processes and combat readiness of U.S. Army units. The research in Phase I was devoted to (a) analysis of the relationship between process performance of battalion command groups and the combat outcomes of battle simulations in which the battalions participated and (b) determination of the feasibility of training Organizational Effectiveness Staff Officers (OESO) to observe and assess the process performance of TOE unit battle staffs and to provide feedback of their observations so that improved performance would result. The results of Phase I serve as a foundation for work to be accomplished in Phase II, which is concerned with training command groups and battle staffs to improve their process performance and, thus, to enhance combat readiness.

Method:

Data were collected on 12 battalions of the 8th Infantry Division in Europe during July and August 1978. As part of a larger training exercise, the command groups of the battalions participated in four modules of PEGASUS battle simulations, during which the process performance of the command groups was observed and assessed by OESOs. Following each module, OESOs reported and discussed their observations with battalion commanders who, at their discretion, used the feedback information to adjust procedures, roles, processes, and behavior within their command groups.

Data collected were (a) OESO ratings of command groups process performance, (b) ratings of combat outcomes by opposing force controllers, and (c) interviews with OESOs and selected battalion commanders.

Results:

Process Performance and Combat Outcomes. A significant correlation of .67 was obtained between overall command groups process performance and overall combat outcomes across the four modules of the battle simulation. This confirmed the expectation of a strong relationship between the quality of organizational process performance and combat outcomes. Correlations between the seven separate processes studied and overall combat outcomes were in the expected direction and were significant for five of the seven.

Comparisons between the six battalions with the highest overall process performance scores and the six with the lowest showed superior performance

by the "more effective" units on all five of the separate components of combat outcomes. Four of these comparisons were significant (.05, one-tailed test), and one narrowly missed attaining significance.

Feasibility of Training Organizational Effectiveness Staff Officers:

OESOs were able to identify the various organizational processes and assess their quality with little difficulty after training by HumRRO personnel. The results indicate that it is feasible to train OESOs to assess process performance and report results of their assessments to commanders and staffs.

Interviews with OESOs and battalion commanders produced a number of "lessons learned" concerning selection, training, and use of OESOs with combat units. The most outstanding finding was the firm conviction of both OESOs and commanders that OESOs must be qualified combat arms officers if they are to be successful in helping to improve process performance in combat units. Other implications and lessons learned are discussed in the report.

Impact of Process Feedback:

The impact of OESO feedback upon process performance was evaluated by comparing process performance between the four modules of the battle simulation. Significant differences were found between all modules, with progressive improvements in process performance following each feedback occurrence.

It was also found that battalion commanders valued the feedback highly, and most expressed the view that the OESOs contributed significantly to improving the performance of the command groups. Furthermore, OESO's process assessment and feedback enhanced their general credibility with commanders, and there were strong indications that the commanders would continue use of OESO consultation after completion of the exercises.

Implications of the results for training command groups and battle staffs are discussed in the report.

Conclusions:

1. The quality of command group performance of the organizational processes included in this research is strongly correlated with unit combat effectiveness, as reflected by the outcomes of battle simulations.
2. Feedback of process observations by OESOs appears to exert a positive effect upon the effectiveness of command groups.
3. OESOs who are qualified in the combat arms can be trained easily to assess and constructively report feedback of their observations concerning the process performance of command groups and battle staffs.

4. It is feasible to train command groups and battle staffs to improve their process performance through the use of OESOs as consultants and trainers.

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CONTENTS

	Page
INTRODUCTION	1
TECHNICAL OBJECTIVES	1
BACKGROUND	2
METHOD	5
PEGASUS	5
Role of Organizational Effectiveness Staff Officers	7
Training of Organizational Effectiveness Staff Officers	7
Data Collection	8
Data Reduction	9
RESULTS	11
Process Performance and Combat Outcomes	11
Training of Organizational Effectiveness Staff Officers	12
Impact of Process Feedback	16
DISCUSSION	18
Process Performance and Combat Effectiveness	18
The OESO and Combat Readiness	19
Recommended OESO Training	20
Training for Command Groups and Battle Staffs	20
REFERENCES	23
APPENDIX A. PROCESS PERFORMANCE ASSESSMENT	25
B. PROCESS DEFINITIONS AND CRITERIA	27
C. SUMMARY PROCESS ASSESSMENT FORM	31
D. CONTROLLER RATING FORM	33

CONTENTS (Continued)

Page

LIST OF TABLES

Table 1.	Summary data for process performance and combat effectiveness	11
2.	Correlations among organizational process scores and combat outcomes	13
3.	Comparison of battalion effectiveness by more and less process effective battalions	14
4.	Analysis of variance for effects of modules upon process performance	16
5.	Paired <u>t</u> -statistics for module differences in organizational competence	17

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INTRODUCTION

This report presents results of the first phase of a project concerned with research on the relationship between organizational process performance and combat readiness of U.S. Army units. The research conducted in Phase I was designed to contribute to increased understanding of the internal processes that lead to combat effectiveness of Army units and to provide understanding of the potential role of Organizational Effectiveness Staff Officers (OESO) in contributing to combat readiness.

To accomplish these purposes, the research in Phase I was devoted to analysis of the relationship between process performance and the combat outcomes of battle simulations and to determination of the feasibility of training Organizational Effectiveness Staff Officers to observe and assess the process performance of TOE unit battle staffs while the staffs are participating in battle simulations. The results of Phase I provide a foundation for work to be accomplished in Phase II.

TECHNICAL OBJECTIVES

The technical objectives of the overall project are to (a) verify the relationship between combat readiness and the performance of certain organizational processes, and (b) determine whether training of Army battle staffs in performance of the processes will enhance the combat outcomes of battle simulations in which they participate.

Objectives for Phase I were as follows:

1. Determine the relationship between process performance by battalion command groups during participation in battle simulations and the combat outcomes of such simulations.
2. Determine the feasibility of training OESOs to observe and assess the process performance of battle staffs while the staffs participate in battle simulations.

Accomplishment of the Phase I objectives will provide fundamental information needed to accomplish Phase II, which is concerned with development of a delivery system for training command groups and battle staffs in process performance and with evaluation of the capability of such training for enhancing combat readiness.

BACKGROUND

The organizational processes which are the focus of the research reported here were identified in a series of studies conducted during the period 1970-76 (Olmstead, Christensen, & Lackey, 1973; Olmstead & Christensen, 1973; Olmstead, Christensen, Salter, & Lackey, 1975). The studies were based upon a conceptual framework derived from General Systems Theory (Miller, 1955; von Bertalanffy, 1956) and several adaptations of Systems Theory to the theory of organizations (Bennis, 1966; Emery & Trist, 1965; Katz & Kahn, 1966; Parsons, 1956, 1960; and Schein, 1972).

The conceptual framework centers around the key concept of Organizational Competence. The concept was derived to encompass, within one term, the internal operational processes used by organizational systems to achieve their objectives and to cope with continuously changing environments. Bennis' concepts of Reality Testing and Adaptability and Parsons' concept of Integration were taken as basic components of Organizational Competence. Thus, Organizational Competence was defined as having the following components:

1. Reality Testing. Capacity to assess the reality of situations facing the organization--the ability of the organization to search out, accurately perceive, and correctly interpret the properties and characteristics of its environments (both external and internal), particularly properties that have relevance for the objectives and survival of the organization.
2. Adaptability. The capacity of the organization to solve problems arising from changing environmental demands and to act with effective flexibility in response to these changing demands.
3. Integration. The maintenance of structure and internal function under change and stress, and a state of relations among sub-units that insures that coordination is maintained and sub-units do not work at cross purposes.

To operationalize the above components so that they could be measured, the following seven processes were derived from Schein's (1972) Adaptive-Coping Cycle:

1. Sensing. The process by which an organization acquires and processes information about its internal and external environments.
2. Communicating Information. The process of transmitting information that is sensed to those parts of the organization that can act upon it.
3. Decision-making. The process of making decisions concerning actions to be taken as the result of sensed information.
4. Stabilizing. The process of taking actions to adjust internal functioning and maintain organizational stability and integration

that might otherwise be disrupted as a consequence of actions taken to cope with changes in the organization's environments.

5. Communicating Implementation. The process of transmitting decisions and decision-related orders and instructions to those parts of the organization that must implement them.
6. Coping Actions. The process of executing actions intended to cope with changes in the organization's environments.
7. Feedback. The process of evaluating the results of a prior action through further sensing of the external and/or internal environments.

It is important to note that each of these organizational processes was conceived to be related to one of the components of Competence. The relationships are as follows:

<u>Competence Component</u>	<u>Organizational Process</u>
Reality Testing	Sensing, Communicating Information, Feedback
Adaptability	Decision-making, Communicating Implementation, Coping Actions
Integration	Stabilizing

Thus, each component of Competence comprises one or more organizational processes that can be measured and whose quality can be evaluated.

The conceptual framework was first tested in a study of 10 simulated U.S. Army Infantry battalion battle staffs (command group and company commanders) engaged in simulated combat operations in a Command Post Exercise (CPX) configuration (Olmstead, Christensen, & Lackey, 1973). It was found that Organizational Competence was strongly correlated with independent criteria of Organizational Effectiveness as measured by battalion performance on a series of mission-related operational problems. Furthermore, the Competence components were differentially related to effectiveness, with Reality Testing contributing the largest proportion of variance, Adaptability contributing a smaller but significant proportion, and Integration a modest proportion.

Organizational processes are the fundamental elements of Competence. The seven processes were found to be differentially related to organizational effectiveness; however, all contributed to some extent. Most correlations were quite high. It should be noted that frequency of process occurrence was not correlated with effectiveness. Thus, Organizational Competence is the quality of process performance. The finding of a very strong relationship between Competence and effectiveness, together with that of no relationship between frequency and effectiveness, permitted

the conclusion that the principal contributor to organizational effectiveness is how well organizational processes are performed, and not how often they occur.

The research on Army battalions was also designed to evaluate the effects upon competence and effectiveness of strong pressure from operational environments and of radical changes within operational environments. It was found that the ability of an organization to respond flexibly to changes in its operational environments is dependent upon its Competence, i.e., the quality of its process performance. Similarly, the ability of an organization to maintain effectiveness under pressure from its environments is related to its Competence.

The results of the above study demonstrate the critical importance of process performance as a determinant of organizational effectiveness. Competence is the adequacy with which an organization performs certain critical processes. When the processes are performed adequately, they assist an organization to be effective. When handled poorly, they may negate many positive effects contributed by efficiency in other areas.

In two additional studies, Organizational Competence was evaluated in organizations that were greatly different from military combat units. Survey techniques were used to evaluate Competence in 31 social service and rehabilitation agencies nationwide (Olmstead & Christensen, 1973) and in an additional 17 social service agencies in nine States (Olmstead, Christensen, Salter, & Lackey, 1975). In both studies, very strong relationships were found between agency effectiveness and Organizational Competence, each of the components of Competence, and each organizational process. Effectiveness was measured in terms of agency productivity and judged quality of agency performance.

The results of the above studies confirm the validity of the conceptual framework as a viable approach for analyzing and understanding the performance of complex organizations. The principal contribution is concrete demonstrations of the importance of the processes subsumed under Organizational Competence as determinants of the effectiveness of organizations, of the relative contributions of the various processes, of the systematic relationships that exist among the processes, and of the ways in which change and pressure influence their performance. It is apparent that Competence plays a major role in the performance of organizations and, accordingly, warrants major attention in efforts to improve effectiveness.

It is also apparent that the concepts and findings discussed above have considerable potential utility for the improvement of combat readiness in operational military units. For example, current Army Training and Evaluation Program (ARTEP) philosophy calls for a unit to be assessed on outcome variables, e.g., mission accomplishment, and there is some provision for assessment of command group proficiency in performance of certain major tasks deemed relevant for accomplishment of combat missions. However, ARTEP assessment practices do not include diagnostic procedures that will enable commanders to better understand and assess the performance by battle staffs of the organizational processes that affect combat outcomes. If such procedures could be developed, they would constitute an important

addition to the training capabilities of unit commanders. The processes that make up Organizational Competence provide a meaningful and feasible framework to develop such procedures.

Organizational Effectiveness Staff Officers are practitioners of the Army's current Organizational Effectiveness (OE) technology. As such, these officers are trained to observe and assist in the diagnosis of group and organizational attributes. Furthermore, they are trained to help commanders plan and implement strategies for change within their units. Accordingly, OESOs possess the basic orientation, training, and skills required to observe and assess the performance of the Competence processes and to assist commanders in training battle staffs or command groups to improve process performance.

The project, the first phase of which is reported here, is concerned with verifying the relationship between combat readiness and performance of the identified organizational processes and with determining whether training of Army command groups in performance of the processes will enhance the combat outcomes of battle simulations in which they participate. As a part of that project, Phase I was devoted to two main objectives: (a) verify the relationship between combat outcomes of battle simulations and the process performance of battalion command groups in such simulations, and (b) determine the feasibility of training OESOs to observe, assess, and report assessments of the process performance of command groups while the groups participate in battle simulations.

METHOD

All data were collected in association with Cardinal Point II, a large training exercise conducted by the 8th Infantry Division in Europe during July and August 1978.

For each battalion, Cardinal Point II was an 11-day exercise consisting of a combination of Field Training Exercise (FTX), battle simulation (PEGASUS), and live firing. The data presented in this report were collected during participation of battalion command groups in the battle simulation phase of Cardinal Point II.

PEGASUS

PEGASUS is a two-sided manual battle simulation that makes possible a training situation in which a battalion command group interacts with controllers at superior-unit levels and with "table controllers" playing friendly unit commanders. The exercise is planned and directed by an Exercise Director. Activities of controllers are supervised by a Chief Controller. Table controllers are supervised by a Chief Table Controller. Using a control map to depict disposition and movement of forces, friendly table controllers maneuver their units according to instructions from the battalion command group so as to engage in combat with enemy units maneuvered by Opposing Force (OPFOR) controllers. Engagement outcomes are determined by manual computation using combat results tables provided specifically for use with PEGASUS. Play is activated by an operations order issued by

Brigade. In the order, a mission is assigned and typical intelligence and other information is provided. Initial friendly and OPFOR unit strengths may be varied according to the training plan and, therefore, differing force ratios may be played. Thus, PEGASUS is a flexible, two-sided, free-play battle simulation which provides dynamic and realistic opportunities for battalion command groups to experience and practice required command and control activities.

In Cardinal Point II, PEGASUS was the vehicle used in the battle simulation phase, in which focus was upon the battalion commander and his staff while controlling and coordinating operations. Company commanders served as "board players," i.e., controllers, for their respective command groups.

During the simulation, each battalion constituted a task force operating in association with another player battalion task force under the command and control of a brigade headquarters. The brigade commander served as Chief Controller and Chief Evaluator, as well as PEGASUS brigade commander.

During one iteration, two battalion task forces conducted simulated combat operations in adjacent lanes of the 8th Division training area. Task force command posts were located on the actual terrain in the respective lanes, while subordinate unit activities, conducted by the company commanders, took place on game boards in a central location at the training area headquarters. Communication was by the conventional radio nets.

The task force CPs displaced as dictated in the operational plans or by the tactical situations. Periodically, company commanders traveled forward to the task force CPs to receive orders, conduct reconnaissance, or take part in critiques conducted by evaluators.

During the 2-month duration of Cardinal Point II, seven iterations of the PEGASUS exercise were conducted. In five iterations, two battalions participated simultaneously. In two iterations, only one battalion participated at a time. Thus, a total of 12 battalions participated.

Each iteration required 4 days to complete. Participation of the command groups was continuous, day and night, during each 4-day period. Within that period, four modules were completed, with each module consisting of one or more types of combat operations. Within each module, the sequence of activities was as follows:

1. Warning order from Brigade
2. Fragmentary order from Brigade
3. Task force orders, terrain reconnaissance
4. Battle simulation (approximately 6 hours)
5. Critique
6. Warning order from Brigade for next module.

With minor deviations, the types of operations covered by the respective modules were the same for all units. Similarly, the sequence in which the operations were executed was the same. On the other hand, specific events within a module varied considerably between units because PEGASUS is a free-play simulation and OPFOR players were free to insert special

problems, e.g., chemical and nuclear play or communications jamming, as deemed useful for training purposes.

Role of Organizational Effectiveness Staff Officers

-- Two OESOs assigned to the 8th Infantry Division participated in the battle simulation phase of Cardinal Point II. Throughout each iteration of the battle simulation, one OESO was stationed at each battalion command post. The OESO systematically observed the activities of command group members as they proceeded to plan and supervise execution of each operation. OESO observations were addressed to identification and assessment of the quality of performance of the various organizational processes by the command group. The focus of the observation was the questions, "What process is occurring? How well is it being performed? How could it have been performed better?"

An OESO remained with a command group continuously throughout the four-module cycle of the battalion's participation in the battle simulation. Upon completion of each module, the OESO rated performance of the command group on each Competence process according to rating scales developed for that purpose (discussed below). Then the OESO met with the battalion commander and reported the results of his observations. Implications of the observations for functioning of the command group were discussed. This procedure of prompt "feedback" to the commander enabled him to obtain immediate assessment of the quality of process performance in the command group and, if deemed advisable by him, afforded the opportunity to make on-the-spot adjustments in procedures, policies, and behavior of members of the command group. In many instances, at the commanders' discretion, OESOs also reported results of observations to command group members and assisted in analyses of ways process performance could be improved.

Thus, an OESO served as "eyes and ears" of a commander with respect to the quality of performance of organizational processes within the command group and provided a mechanism through which on-the-spot feedback could be made available to the commander. In addition, OESO ratings of process performance were one major source of data for this study.

Training of Organizational Effectiveness Staff Officers

Three days before the battle simulation phase of Cardinal Point II, researchers met with the two 8th Division OESOs for the purpose of training the OESOs to observe and assess process performance of battalion command groups. Two days were devoted to the training.

Prior to beginning of training, the OESOs had studied "Components of Organizational Competence: Test of a Conceptual Framework" (Olmstead, Christensen, & Lackey, 1973), which describes the theoretical background and conceptual framework for the Competence processes and presents results of the earlier study of Army battalions. The training consisted of review and elaboration of the fundamental concepts; analysis of the PEGASUS configuration for Cardinal Point II and its implications for operational

definition of the processes; revised definitions of the processes for application to single-level organizations, i.e., to command groups alone; procedures for observing and identifying the processes within command groups; procedures for assessing the quality of process performance; and recommendations for providing feedback of observations. In addition, data collection forms and procedures for recording process ratings were reviewed. General questions to be addressed in assessment of process performance are shown in Appendix A. Definitions of the processes and criteria for identifying and assessing them are shown in Appendix B.

It is important to note that both OESOs were combat arms officers, with experience in battalion staff activities. These qualifications and experience, coupled with their OE training, made translation and application of the conceptual framework decidedly more effective.

After OESOs participated in the first iteration (two battalions), the researchers met with the OESOs to review and clarify any problems encountered.

Data Collection

Data were collected on 12 battalion command groups. Included were seven Mechanized Infantry and five Armor battalions. Following completion of each module, OESOs rated process performance and OPFOR controllers rated combat effectiveness of the battalions, as described below. The ratings were collected immediately upon completion. Thus, for each battalion there were available four ratings (one for each module) on process performance and four on combat effectiveness.

OPFOR controllers varied their inputs depending upon the tactical situation. In addition, different types of operations were judged to vary in terms of difficulty. To obtain some indication of relative difficulty of the four modules, the Chief Controller and the Chief OPFOR Controller rated difficulty of each module for each unit on a 5-point scale. Mean ratings across units were computed to obtain an index of difficulty for each module.

Process Performance Ratings. After completion of each module, the OESOs assigned to the respective battalions completed the form shown in Appendix C. The form contains seven items, one for each organizational process, upon which an OESO rated the performance of a command group. Raters used a 4-point scale, chosen because it was found in the original study of Army battalions (Olmstead, Christensen, & Lackey, 1973) that assessors of process performance encountered difficulty in discriminating quality of performance when scales of more than 4 points were used.

Data forms were collected immediately after completion by OESOs. Since one OESO was assigned to each battalion command group, one set of ratings was produced for each command group for each module.

Combat Effectiveness. Upon completion of each module, OPFOR controllers completed the Controller Rating Form shown in Appendix D. It will be

recalled that, in most instances, two battalions participated in tandem. Thus, two PEGASUS gaming simulations were conducted simultaneously, one for each of two battalions, with the battalions participating in the roles of adjacent task forces under the direction of a single brigade commander. For each simultaneous simulation, a team of three OPFOR Board controllers conducted play of enemy operations. A Chief OPFOR Controller supervised the activities of the two teams. All members of each team of OPFOR controllers completed the Controller Rating Form for respective battalions for which they served as controllers. The Chief OPFOR Controller rated both battalions. Thus, for each battalion, ratings of four controllers were collected.

The Controller Rating Form consisted of five items addressed to a number of aspects of combat outcomes as reflected in the battle simulation. For all items, respondents used 5-point rating scales with 3 anchor points having descriptors specific to the content of the items.

Interviews. The two OESOs were extensively interviewed after completion of the entire exercise to identify problems encountered, lessons learned, and experiences that might prove useful in development of training. In addition, several battalion commanders were interviewed to obtain their judgments of the impact of OESO feedback.

Data Reduction

Data consisted of OESO ratings of process performance, OPFOR Controller ratings of combat effectiveness, and interviews with OESO and battalion commanders.

Process Performance. For each battalion, the OESO ratings of performance of a process constituted a Module Process Score, with a possible score range of 1 to 4. Thus, for an exercise (four modules), a unit could receive, for each organizational process, a minimum score of 4 and a maximum score of 16. Scores for Organizational Competence were computed as the sum of the seven process scores. For a module, the minimum possible Competence Score was 7 and maximum was 28. For an exercise, a battalion's Competence Score could range from 28 to 112.

Combat Effectiveness. The problem was to develop a procedure which would make it possible to order participating battalions in terms of overall effectiveness. An adaptation of a procedure previously used for assessing battle simulation outcomes of brigades (Olmstead, Baranick, & Elder, 1978), based on earlier work by Tiede and Leake (1971), was used to develop the index of combat effectiveness.

Following the earlier work by Tiede and Leake, two dimensions were identified that define the mission space of a unit:

1. Area: the area or geographical objectives controlled in accomplishing the mission or during the engagement.
2. Resources: the quantity of resources (personnel, weapons, equipment) expended, or remaining, at the end of the engagement.

Appropriate combinations of indicators of these two dimensions make it possible to order participating units in terms of outcomes. For this project, the procedure consisted of operationally defining anchor points on 5-point scales for Area (Controller Rating Form Item 2) and Resources (Controller Rating Form Item 3). Using the two Controller Rating Form items, there resulted a 5 x 5 matrix, each cell of which was a possible outcome in terms of combinations of the two dimensions. The matrix follows:

RESOURCES	AREA					
	Control of area was in full compliance with mission requirements including time schedules		Mission requirements and partly met with respect to control of area		Mission requirements not met in any way	
	Remaining strength such that operation can be continued without interruption	5	4	3	2	1
		4				
	Resources remaining were not more than 75 nor less than 60 percent	3				
	2					
	Resources remaining make unit ineffective, should be replaced.	1				

For each battalion, module mean OPFOR controller ratings were computed for Items 2 and 3 of the Controller Rating Form. To obtain an index which represented a combined Resources and Area outcome, module mean ratings for Items 2 and 3 for each battalion were added. The sum of these two ratings was designated the Combat Effectiveness Score. The result was a distribution of 12 battalion scores for each module, with a possible range of 2 to 10 for a module. In addition to the Combat Effectiveness Score described above, a second index was suggested by examination of the matrix of inter-correlations of the five separate OPFOR controllers' ratings of battalion combat outcomes. All five were highly intercorrelated, indicating the high probability of a single underlying dimension. The average of the five separate ratings, thus was selected as the second index of battalion combat performance.

RESULTS

Quantitative data were available from OESO ratings of command group process performance and OPFOR Controller ratings of combat outcomes of PEGASUS battle simulations. For each battalion, total scores for the exercise and scores for each of the four modules composing the exercise were obtained. Table 1 shows summary data for the seven organizational processes, Organizational Competence (sum of the process scores), and Combat Effectiveness, as measured by performance outcome Items 2 and 3.

Table 1
Summary Data for Process Performance
and Combat Effectiveness

Variable	Module ^{1,2}								Exercise (Sum of Module Scores)	
	1 (2.45)		2 (3.54)		3 (4.25)		4 (3.17)			
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Sensing	2.25	.75	3.08	.52	3.25	.62	3.67	.49	12.25	1.48
Communicating Information	1.83	.96	2.75	.62	3.17	.58	3.58	.69	11.33	2.06
Decision Making	3.58	.51	3.75	.45	3.67	.49	4.00	.00	15.00	1.34
Stabilizing	3.08	1.31	3.25	.97	3.33	.89	3.42	.90	13.08	3.70
Communicating Implementation	3.42	.78	3.58	.52	3.41	.69	3.67	.49	14.08	1.92
Coping Actions	3.33	.79	3.50	.52	3.58	.52	3.58	.52	14.00	2.13
Feedback	2.00	.74	2.67	.65	3.17	.84	3.42	.52	11.25	2.13
Organizational Competence	18.91	2.96	22.25	3.54	23.50	3.52	25.25	2.83	89.91	11.60
Combat Effectiveness	4.72	1.00	5.62	1.28	4.79	1.65	6.13	1.04	21.25	3.10

^{1/} Numbers in parentheses following module designations are difficulty ratings, maximum difficulty = 5.00.

^{2/} Possible score ranges:	Module	Exercise
Processes	1-4	4-16
Competence	7-28	28-112
Combat Effectiveness	2-10	8-40

Process Performance and Combat Outcomes

Examination of the raw competence scores suggested the strong likelihood of a rater mean bias effect. That is, one of the two raters had a mean that was substantially higher than the other rater's mean. To control

for this bias, the separate process performance ratings were all transformed to standard scores, and the remainder of the analysis was conducted on the standard score forms.

Pearson product moment correlations were computed between the components of Organizational Competence, on the one hand, and the components of combat effectiveness, on the other hand. These correlations, together with those for Total Competence and the two Combat Effectiveness scores, are shown in Table 2. Of particular note are the correlations of .67 and .63 between the two Combat Effectiveness scores of total Organizational Competence. These correlations were significant at the .01 and .05 levels, respectively. Thus, a significant and strong positive relationship was found between the quality of battalion command group organizational process performance and combat outcomes as measured in a battle simulation.

Examination of the relationships between combat effectiveness and individual process performance scores, and between Total Competence and the individual elements of combat effectiveness, suggests further conclusions. Combat effectiveness correlated most strongly with the individual processes concerned with Reality Testing: Sensing, Communicating Information, and Feedback. Of these three, relationships were strongest with Sensing and Feedback, the two processes assessing the effectiveness with which the command group looked for and obtained information about its combat environment. In systems terms, the quality of processes performed within the organization, such as decision-making, were less strongly correlated with overall outcomes than the quality of processes concerned with seeing outside itself.

The distribution of standardized Organizational Competence scores was split at the median, and the six highest and lowest battalions were grouped. Table 3 shows mean combat outcome ratings for the separate components and for both Combat Effectiveness scores. All comparisons were significant at the .05 level (one-tailed test) except the rating of resources remaining, which narrowly missed significance. The largest differences between high and low Organizational Competence battalions were on the variables of mission accomplishment and force exchange ratio. The latter is particularly noteworthy in view of current U.S. Army doctrine for fighting a central battle against near overwhelming odds. The doctrine calls for trading time and terrain, within well-defined limits, for the opportunity to inflict disproportionately high losses on the enemy. This clearly will work only if friendly forces have the skill to achieve a highly favorable loss exchange ratio. Battalions with high Competence scores in the present research had better loss exchange ratios. If further research confirms the present finding, an important approach to helping the current doctrine work well has been found.

Training of Organizational Effectiveness Staff Officers

The fact that the two OESOs who participated in the project were able to identify the various organizational processes and assess their quality with little difficulty during the intensive activity characteristic of battalion TOCs during combat operations demonstrates the feasibility of training OESOs to perform these functions. The OESOs were trained on an

Table 2

Correlations Among Organizational Process
Scores and Combat Outcomes

	Total Competence	Sensing	Information Communication	Decision Making	Stabilizing	Communication Implementation	Coping	Feedback
Batt Eff 1-5	.67* .008	.60 .02	.49 .05	.49 .05	.34 .14	.50 .05	.41 .09	.62 .02
Batt Eff 2-3	.63 .02	.58 .02	.32 .15	.55 .03	.34 .14	.30 .17	.39 .10	.63 .01
Mission Accompl.	.56 .03	.52 .04	.36 .12	.33 .11	.21 .25	.59 .02	.27 .20	.53 .04
Geographical Control	.62 .01	.59 .02	.39 .11	.48 .06	.28 .19	.37 .12	.40 .10	.59 .02
Resources Remaining	.45 .07	.39 .10	.14 .33	.47 .06	.32 .15	.11 .36	.27 .20	.50 .05
Force Ex- change Ratio	.64 .01	.48 .06	.74 .003	.36 .13	.39 .10	.56 .03	.41 .09	.46 .07
Overall Ef- fectiveness	.53 .04	.47 .06	.3 .08	.34 .14	.22 .25	.39 .10	.37 .12	.47 .06
Batt Staff Effectiveness	.53 .04	.66 .009	.52 .04	.11 .37	.06 .42	.40 .10	.06 .43	.59 .02
Total Com- petence	---	.80 .001	.81 .001	.79 .001	.58 .03	.64 .01	.66 .01	.91 .001
Sensing	.80 .001	---	.61 .02	.39 .11	.08 .41	.56 .03	.25 .21	.85 .001
Information Communication	.81 .001	.61 .02	---	.47 .06	.63 .01	.65 .01	.37 .12	.61 .02
Decision- Making	.79 .001	.39 .11	.47 .06	---	.76 .002	.21 .26	.90 .001	.63 .01
Stabilizing	.58 .03	.08 .40	.63 .01	.76 .002	---	.19 .28	.60 .02	.27 .20
Communica- Implementat.	.64 .01	.56 .03	.65 .01	.21 .26	.19 .28	---	.60 .5	.62 .02
Coping	.66 .01	.25 .21	.37 .12	.90 .001	.60 .02	.04 .45	---	.54 .04
Feedback	.91 .001	.85 .001	.61 .02	.63 .01	.27 .20	.63 .01	.54 .04	---

*The top number within a cell is the correlation coefficient. The bottom number is the computed significance of the correlation.

Table 3
Comparison of Battalion Effectiveness by More and Less
Process Effective Battalions¹

Effectiveness Dimension	More Effective Process		Less Effective Process		t	P ₂
	Mean	SD	Mean	SD		
Mission Accomplishment	3.43	.46	2.80	.24	2.96	≤.01
Geographical Area	3.39	.50	2.83	.36	2.18	≤.03
Resources Remaining	2.35	.29	2.03	.39	1.76	≤.054
Force Exchange Ratio	2.91	.19	2.39	.35	3.23	≤.005
Overall Effectiveness	3.34	.37	2.96	.36	1.81	≤.05
Battalion Staff Effectiveness	4.13	.49	3.73	.20	1.86	≤.046
Battalion Effectiveness 1-5	3.09	.31	2.60	.21	3.21	≤.004
Battalion Effectiveness 2-3	2.88	.33	2.43	.31	2.67	≤.02

¹Sample size is 12 battalions. Scores shown are exercise (four modules) means.

²One-tailed test.

intensive face-to-face basis by the contractor's project director, who had derived and tested the original concepts and, accordingly, was most intimately familiar with the conceptual framework and the action implications of the concepts. However, the ease with which the OESOs assimilated the concepts and recommended procedures and applied them within the context of an operational TOC leaves little doubt that properly qualified OESOs can be trained to assess process performance and give feedback on the results of such assessments in a meaningful manner.

Experience in conducting the training and interviews with OESOs and battalion commanders following the exercises suggest a number of points for consideration in selecting and training OESOs. By far the most critical consideration involves the qualifications and experience required by OESOs. Both the OESOs and the battalion commanders who were interviewed were unanimous and emphatic in their views that an OESO who attempts to assess and feedback process performance related to combat operations should be combat arms qualified and familiar with the roles and functions of combat commanders and staffs. Battalion commanders felt such qualifications are necessary for the credibility of OESOs. In short, commanders would not be receptive to feedback from OESOs who do not possess first-hand knowledge of combat command group functions. The two OESOs fully agree with this view and, in addition, maintain that although individuals who lack the above qualifications might be able to identify processes, they would not be able to accurately assess whether the processes were performed well and to identify sources of deficiency. Similarly, it appears that OESOs with background and experience relevant to the units under scrutiny will be most likely to be successful in other types of organizations.

With respect to training of OESOs, the following important considerations were identified:

1. Although OESOs reported little difficulty in understanding the general concepts, careful instruction is required in application of the concepts within particular contexts, e.g., in battle simulations.
2. Either identification criteria specific to particular contexts must be provided or instruction must be provided in general procedures for specifying and defining criteria.
3. Since the efficacy of a process is situation-determined, it is not possible to provide universally applicable specific criteria for assessing quality of process performance. However, instruction in the use of general criteria concerning process quality must be provided.
4. OESOs reported that they did not feel genuinely comfortable in making process observations until the third iteration of PEGASUS. This suggests that training should be heavily experiential in order to provide students as much experience in active observation as possible prior to the first "for real" observations.
5. OE training provides a solid foundation in techniques of feedback; however, instruction should include some guidance in the

specific applications of such techniques to feedback of process observations.

Impact of Process Feedback

The OESOs reported to and discussed their process observations with battalion commanders following completion of each module. An important question is concerned with the impact of that "feedback" upon the process performance of the command groups.

The impact of feedback was evaluated by comparing Organizational Competence scores for the four modules (Table 1). Table 4 summarizes the results of a simple one-way analysis of variance used to test the effects of modules.

Table 4
Analysis of Variance for Effects of Modules
upon Process Performance

Source	SS	df	MS	F	p
Total	717.98	47			
Modules	257.56	3	85.85	8.20	<.01
Error	460.42	44	10.46		

Module effects were significant. Table 5 shows t-statistics for differences between module means for Organizational Competence. All differences were significant.

Table 1 shows that mean process performance (Organizational Competence) increased throughout the exercise, and Table 5 shows that differences among all modules were significant, indicating that OESO feedback probably exerted positive effects upon process performance of command groups. It is recognized that simple practice effects were not controlled. However, control of practice effects will be permitted by the design of Phase II of this research, and this issue consequently is deferred until completion of that work.

Given the possibility that process feedback did affect subsequent process performance, the differences between Modules 1 and 2 and 1 and 4 are of particular interest. Performance in Module 1 occurred prior to any feedback or discussion of organizational processes. Accordingly, scores for the first module constitute baseline data against which scores for the succeeding modules can be compared, and differences between performance in

Modules 1 and 2 provide the most clear-cut demonstration of the impact of feedback. The mean improvement of 3.34 points for Module 2 is the largest increase between any of the succeeding modules and suggests that the initial feedback exerted the greatest impact upon process performance. However, continuing increases in succeeding modules suggest cumulative effects result from repeated occurrences of feedback.

Table 5

Paired t -Statistics for Module Differences
in Organizational Competence

Module	Module ¹			
	1	2	3	4
1	-	3.98	7.69	7.82
2		-	2.09	5.32
3			-	3.02
4				-

¹Degrees of freedom = 11; $p < .05 = 1.796$,
 $p < .01 = 2.718$ for one-tailed tests.

From Module 1 to Module 4, process performance improved an average of 6.34 points. Least improvement was 3 points for a unit which, because of a high initial score, had only a small margin for improvement. Greatest improvement was 13 points. Process performance of all command groups improved across the four modules.

Interviews with the two OESOs revealed that although some battalion commanders had initial reservations about the potential value of process feedback, most commanders rapidly perceived its utility and used the information provided by the OESOs to make on-the-spot adjustments in staff procedures, role relationships, and even leadership styles during the course of the exercises. OESOs cited numerous instances of constructive changes initiated by the commanders and of improved coordination and teamwork, with resulting improvements in overall command group performance. In addition, all commanders invited the OESOs to continue to work with their units after completion of Cardinal Point II.

At a general critique session held after all units had participated in PEGASUS, battalion commanders were positive about the value of OESO process observations and feedback. Commanders felt that the presence of

an OESO in the TOC "provided another set of eyes for examining command group functioning" and "provided a different perspective." A representative of OETC interviewed four commanders and all felt that the OESO contributed significantly to improved combat readiness.

In view of these findings, it is concluded that OESO feedback of process observations had a significant, positive impact upon performance of the organizational processes and that these observations and subsequent feedback to unit commanders contributed substantially to improved combat outcomes of the battle simulations.

DISCUSSION

The results of this research led to the conclusions that the organizational processes identified in Project FORGE (Olmstead, Christensen, & Lackey, 1973) are indeed related to combat outcomes, that improvements in process performance should contribute to improved combat readiness, and that Organizational Effectiveness Staff Officers can serve an important function in assisting commanders to improve the Organizational Competence (process functioning) of their units through process analysis, feedback, and training.

Process Performance and Combat Effectiveness

One weakness of the 1973 study was that ad hoc groups were used to form the battle staffs that were studied. In the research reported here, participants were members of actual command groups engaged in the conduct of combat operations under field conditions. Since these findings are remarkably similar to those of the earlier study, it can be concluded with confidence that the processes subsumed under the rubric of Organizational Competence are important contributors to unit combat performance, as such performance is reflected in the outcomes of battle simulations. To the extent that the command and control system of a unit influences the performance of a unit, organizational processes are determinants of unit performance. The results do not suggest that organizational processes are the sole determinants of unit effectiveness; however, it would appear that, because of their criticality for command and control, it is unlikely that a unit can be combat effective if the processes are not performed at least adequately.

Observations conducted during this study also reinforce the concept that Organizational Competence is a system attribute; that is, organizational processes must be performed by all members of a command group or battle staff. Ideally, they take the form of coordinated activities that bring information, decisions, and actions from many sources into conjunction through a complex interplay between positions and between organizational levels. Through such interplay, the various activities of the organizational system are integrated and their parts result in the unified action required of an effective combat unit.

Organizational Competence is concerned mainly with the quality of performance of the command and control system within a military unit. The

development of Competence within a combat unit can be expected to produce (a) a more smoothly functioning battle staff; (b) improved capabilities for adjusting to changes in tactical environments and situations with minimal wasted effort, lost motion, or reduced effectiveness; and (c) higher levels of effectiveness under the sustained pressures of combat. Accordingly, it would appear that attention to process performance should be an essential consideration in the development of combat readiness.

The OESO and Combat Readiness

The main values of the conceptual framework subsumed under Organizational Competence are that it (a) offers a systematic way of thinking about some otherwise exceedingly slippery phenomena and (b) provides a workable framework for the assessment and diagnosis of organizational functioning and for the correction or improvement of dysfunctional elements. The processes associated with Organizational Competence can be operationally defined and, once made operational, they provide concrete bases for assessment and improvement of unit functioning.

The results of this research indicate that the Organizational Effectiveness Staff Officer can be an effective instrument for using the conceptual framework to assess and improve unit functioning. OESOs are trained to think about military units in systems terms, and by virtue of their OE training, they possess the skills needed to establish effective relationships with unit commanders and to maintain the appropriate consultative perspectives while providing feedback based on the results of their observations and assisting commanders to effect changes in what could be extremely sensitive areas of their organizations. The training and experience possessed by competent OESOs makes it possible to train them in the concepts of Organizational Competence and the skills required for assessment of process performance with a minimum of time, effort, and reorientation of their usual approaches to organizational change. The only requirements are (a) a shift in emphasis from maintenance (quality of life) processes, which is the predominant focus of current OE activities, to the conversion (operational) processes associated with Organizational Competence, and (b) development of skills in observing and assessing ongoing activities in a combat environment. In passing, it is worth noting that Organizational Competence applies equally to garrison environments and noncombat organizations, and attention to operational processes in these contexts can be expected to prove as useful as in combat units.

The OESOs who participated in the research reported here were able to learn the concepts, develop the skills, and make the transition to a combat environment rather painlessly. To be sure, the individuals involved were experienced as combat arms officers and possessed outstanding experience and maturity as OESOs. However, there is no reason to believe that the average, competent OESO could not acquire the required knowledge and skills when provided reasonably effective training conducted by knowledgeable instructors. In addition to these knowledges and skills, the one major requirement for effectiveness appears to be the ability of the OESO to establish credibility with members of command groups and battle staffs. This will be most easily accomplished if the OESO is a combat arms qualified officer.

Recommended OESO Training

Training intended to equip OESOs with full capabilities for assessing process performance and assisting commanders to improve process performance of their units should include the following:

1. Review of organizations as systems and of systems theory concepts with emphasis upon adaptability to external changes, conversion processes, and relationships between maintenance processes and conversion processes in organizational systems.
2. Concepts of Organizational Competence and its associated processes, to include definitions, relationships, applications to military combat and noncombat organizations, and evidence of relevance for military organizations.
3. Procedures for operationally defining and identifying the FORGE organizational processes in operational contexts and organizations.
4. Procedures and instruments for observing and assessing process performance in combat and noncombat organizations and contexts.
5. Procedures for providing feedback on process observations and assessments to commanders and other unit members.
6. Strategies for improving process performance.

The concepts and background will have to be presented through lecture and discussion methods. However, it is recommended that such procedures be kept to a minimum and that heavy emphasis be placed upon practical exercises and other experiential methods. If at all possible, participation and/or observation in a battle simulation, or mini-simulation, is strongly recommended.

Training for Command Groups and Battle Staffs

The finding that the quality of process performance is related to battle simulation outcomes leads to the conclusion that training command groups and battle staffs to improve their performance of the fundamental operational processes will contribute to enhanced combat readiness of tactical units. Although the findings of this research are limited to command groups, i.e., to battalion commanders and their staffs, the concepts of Organizational Competence and its associated processes apply to the entire command and control system of a unit, and much of the dysfunction in processes occurs in the interaction and flow of communication between levels within an organization. Accordingly, maximum unit effectiveness can be expected only when personnel at all levels are equally proficient in performance of the processes and their separate activities are integrated into a unified system of decision and action. In short, Organizational Competence involves both individual process proficiency and teamwork among all levels of a unit. Such proficiency and teamwork is best accomplished through systematic training.

The obvious choice for implementing such training is the Organizational Effectiveness Staff Officer. The research reported here has demonstrated that OESOs are able to learn the relevant conceptual framework and can be trained to understand, assess, and provide feedback on observations concerning process performance within combat units. Accordingly, it appears to be entirely feasible to develop instructional procedures which would use the training, experience, and capabilities of OESOs as the basis for providing experience-based training to command groups and battle staffs. Of course, such training would remain under the control of TOE unit commanders. However, initial formal training would involve OESOs as trainers, consultants, process observers, and resource personnel. It would be expected that, eventually, process practice and assessment would become an ongoing unit activity, conducted by unit personnel.

Following are recommendations for implementation of process training for TOE unit personnel:

1. Training should be capable of being conducted locally by TOE unit personnel assisted by an OESO who has been instructed in procedures for conducting such training.
2. Insofar as is feasible, training should be experiential, i.e., it should provide participants experience in performing processes under controlled conditions, assessing their performance, and practicing ways of improving performance.
3. Emphasis in training should be upon the performance of processes rather than identification of them (as in training for CISOs).
4. Training should emphasize coordination, teamwork, and exchange of information, in addition to performance of the separate processes.
5. Training should provide opportunity for role identification and role clarification in relation to performance of the various processes.
6. Training should include a short block of instruction concerned with the potential role of OESOs as process observers and with the utility and use of OESO feedback in field training exercises, CPXs, etc.
7. Insofar as is administratively feasible, training should include participation in a battle simulation, with process assessment and feedback conducted periodically by OESOs.
8. For the training to be maximally effective, a full training program should be designed and developed, to include procedures to be used by OESOs in conducting the training, all materials to be used during training, and detailed guidance for conducting the training.

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APPENDIX A

PROCESS PERFORMANCE ASSESSMENT

SENSING

- Was all information available to the organization obtained by it?
- Were attempts to obtain information relevant and effective?
- Was correct interpretation placed upon information that was obtained?
- In view of the information available to the organization, was a correct assessment made?
- Was sensing performed effectively at all levels?

COMMUNICATING INFORMATION

- Was information sensed by the organization communicated to everyone who needed it when they needed it?
- Was communication of information complete, accurate, and timely?
- Was communication of information efficient?

DECISION-MAKING

- Was all relevant, available information used in decision-making?
- Were decisions made at each level correct in view of information available to decision-makers?
- Were decisions timely?

STABILIZING

- When decisions were made, were their potential effects upon the organization taken into account and action taken to counter any negative effects?
- Were internal operations or organizational arrangements adjusted appropriately to accommodate to new decisions?

COMMUNICATING IMPLEMENTATION

- After decisions, was communication about implementation requirements complete, accurate, and timely?
- Was everyone informed about implementation decisions and requirements that should be informed?

COPING ACTIONS

- Was execution of actions correct and effective?
- Were all actions leading from decisions actually carried out?

FEEDBACK

- Was action taken to obtain information about the outcomes of actions and decisions?
- Was information obtained in follow-up used to modify activities or make new decisions?

APPENDIX B

PROCESS DEFINITIONS AND CRITERIA

Process	Definition	Identification Criteria	Evaluation Criteria
Sensing	The act of acquiring information from or concerning any environment of the organization.	<ol style="list-style-type: none"> Any act by a player of receiving, obtaining, or attempting to obtain information, orders, instructions, or recommendations from someone or something outside of the simulated organization. May involve passive receipt of information without initiative to obtain it or may involve active attempt to obtain information. Involves player-controller interaction in any mode. In gaming simulations where company commander engages in board play as a "player/controller," Sensing includes company commander's "receipt" of information from the board, i.e., his sensing of board play. 	<ol style="list-style-type: none"> Accurate detection of all available information. Correct interpretation of all detected information, to include appropriate weighting of its importance. Accurate discrimination between relevant and irrelevant information. Attempts to obtain information are relevant to mission, task, or problem. Sensing activities are timely in relation to information requirements and the tactical situation.
Communicating Information	Those activities through which information which has been sensed by some representative of the organization is made available to those who must act on it or make decisions about it.	<ol style="list-style-type: none"> Transmission and discussion of information by players after it has been sensed and before a decision has been made about it. May pass through several links between sensing personnel and decision makers. Player-player interaction, except where player informs Brigade controllers or subordinate unit controllers and information sensed. May involve: <ol style="list-style-type: none"> Initial transmittal of information by sensing individual. Passing on of information by linking personnel. Dissemination of information throughout organization. Discussion and interpretation—Discussion for clarification or implication. Includes communication of recommendations from subordinate units. 	<ol style="list-style-type: none"> Accuracy of transmission of available information. Sufficiently complete to transmit full and adequate understanding to the receiver. Timeliness appropriate to unit requirements. Correct choice of recipients. Whether message should have been communicated.

(Continued)

Process	Definition	Identification Criteria	Evaluative Criteria
Decision Making	Deliberative activities of one or more persons leading to a conclusion that some action will, or should, be taken by the organization. Usually evidenced by the initial communication of the decision by the decision maker. The communication may take the form of announcement of the decision, a command, an order, or instructions. Decisions may lead to Active Sensing, formal Sensing Actions, Stabilizing Actions, Coping Actions, or Feedback Actions. Decision making includes decisions to rescind decisions. Decision making is not limited to commanders; it may include all players.	<ol style="list-style-type: none"> 1. A communication of some sort reflecting the intention to take some kind of action. 2. Most often, the first evidence that a decision has been made will be a command, order, or instruction (oral or written) issued by the decision maker. 3. Usually player-player interaction; but at lower boundary of simulated organization, may involve player-controller interaction. 4. In Pegasus, the only evidence of a decision made by a company commander may be his interaction with the game board, i.e., his movement of pieces on the board (this would be a combination in one activity of decision making and coping action). 	<ol style="list-style-type: none"> 1. Adequacy—Was the decision adequately correct in view of circumstances and information available to the decision maker? 2. Appropriateness—Was the decision timely in view of the information available to the decision maker? 3. Completeness—Did the decision take into account all or most contingencies, alternatives, and possibilities?
Stabilizing	Actions intended to adjust internal operations, maintain internal stability or unit integrity, or prevent disruptions and negative side effects, as a consequence of coping actions. All actions intended to prevent potential negative effects to the organization which might occur because of Coping Actions.	<ol style="list-style-type: none"> 1. Player/player interaction. 2. Limited to actions specifically intended to moderate the potential side effects of Coping Actions or to adjust internal organization or operations necessitated by the potential effects of a Coping Action. 	<ol style="list-style-type: none"> 1. Adequacy—Action is correct in view of the operational situation and the decision on order from which the action derived. 2. Appropriateness—Timing is appropriate in view of situation and the decision or order from which it derived. Choice of recipient of the action is appropriate. 3. Completeness—Action fully implements the decision from which it derived or fully meets the requirements of the situation.
Communicating Implementation	Those activities through which decisions and requirements resulting from decisions are communicated to those individuals or units who must implement the decisions. Includes (1) transmission of orders or instructions and (2) "discussion and interpretation—those communications through which clarification is achieved and implications for action are discussed. Includes all communication links between decision maker and final implementer of decision.	<ol style="list-style-type: none"> 1. Player/player interaction. 2. Occurs after decision and before action. 3. Includes orders, instructions, and discussion of them and their implications, including clarification and attempts to obtain clarification. 4. Limited to communication about actions to be taken. 5. May pass through several links between decision maker and executor of action. 	<ol style="list-style-type: none"> 1. Accuracy of transmission of instructions. 2. Sufficient completeness to transmit adequate and full understanding of actions required. 3. Timely transmission in view of both available information and the action requirements of participants. 4. Transmission to appropriate recipients. 5. Whether message should have been communicated.

(Continued)

Process	Definition	Identification Criteria	Evaluative Criteria
Coping Actions	The process of executing actions against target environments. Primarily concerned with execution and with how actions are carried out.	<ol style="list-style-type: none"> 1. Player/controller interaction. 2. Actions taken in the point of contact with target environments i.e. at boundaries of simulated organization. 3. Actions to "do something to" the external environment, i.e., to change or cope with the target environment. 4. Does not include actions to obtain information. 5. In battle simulations, coping actions may take form of orders or instructions to subordinate units played by controllers. 6. In battle simulations where company commander is a player/controller interacting with a game board, coping actions are his execution of the board play. 	<ol style="list-style-type: none"> 1. Correctness of action in view of both the operational circumstances and the decision or order from which the action derives. 2. Timeliness of the action in view of both operational circumstances and the decision or order from which the action derives. 3. Correctness of choice of target of the action. 4. Adequacy of execution of action.
Feedback	Activities that assist the organization to evaluate the effectiveness of its actions and that provide information upon which adjustments and future actions can be based.	<ol style="list-style-type: none"> 1. Formal actions taken to obtain information about the results or effects of Coping Actions. 2. Player/controller interaction only. 3. Should be preceded by an organizational decision to initiate a feedback action. 	<ol style="list-style-type: none"> 1. Correctness of the action in view of both the operational circumstances and the decision or order from which the action derives. 2. Timeliness of the action in view of both the operational circumstances and the decision or order from which the action derives. 3. Correctness of choice of target of the action. 4. Adequacy of execution of the action.

APPENDIX C

Battalion Identification _____ Module No. _____
Type of Operation _____
Rater _____

SUMMARY PROCESS ASSESSMENT FORM

This form is to be completed at the end of each PEGASUS module. Use the scale shown below to rate the overall performance of the battalion players (battalion command group and company commanders) as a unit on each of the listed processes during the module. Use the scale to select the description that best fits your assessment of the battalion's performance of the process being rated. Enter in the space preceding each process, the number of the descriptor that best fits your assessment.

Scale

- 4 - Excellent
- 3 - Adequate
- 2 - Marginal
- 1 - Poor

<u>Rating</u>	<u>Process</u>
_____	Sensing
_____	Communicating Information
_____	Decision Making
_____	Stabilizing
_____	Communicating Implementation
_____	Coping Actions
_____	Feedback

APPENDIX D

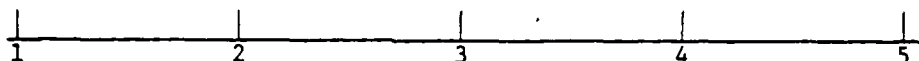
Battalion _____

Controller Position _____

CONTROLLER RATING FORM

Please rate the battalion indicated above on each item below. For each item, make your judgment according to the combat outcome of the exercise. Do not rate the performance of the command group alone. Instead, rate the battalion, as a whole, in terms of its combat results. If several types of operations were conducted, e.g., attack, defense, etc., and the unit did better on some operations than others, base your ratings on your overall impression of all of the combat results achieved by the unit. For each item, place an "X" on the scale point that represents your best judgment.

1. Rate the extent to which the battalion accomplished its mission stipulated in the Brigade OPORD, including any changes subsequent to the initial OPORD.

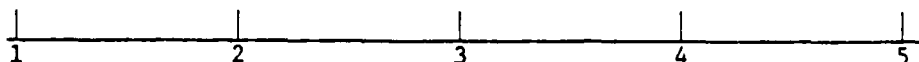


Mission
requirements
were not
met in any way

Unit was
reasonably effective
in view of
circumstances

Mission was
accomplished
in all respects

2. Rate the extent to which area, or geographical objectives, was controlled by the battalion in accordance with its mission, to include any time schedules stipulated in its mission for holding areas or taking objectives.

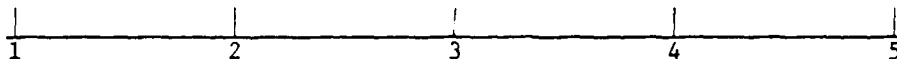


Mission area
requirements
were not
met in any way

Mission require-
ments were only
partly met with
respect to control
of area

Control of area
was in full
compliance with
mission require-
ments, including
time schedules

3. Rate the expenditure of resources (personnel, weapons, equipment) by the battalion. (For this item, do not consider ratio of friendly to enemy losses. Rate only in terms of the condition of the battalion at the end of the exercise or operations.)

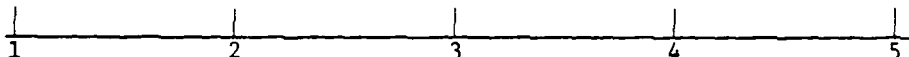


Resources remaining make unit ineffective. Should be replaced.

Resources remaining are not more than 75 nor less than 60 percent.

Remaining strength such that operation can be continued without interruption.

4. Rate the expenditure of resources (personnel, weapons, equipment) by the battalion in relation to losses of resources by the threat forces opposing it, i.e., the ratio of friendly to threat losses of resources.

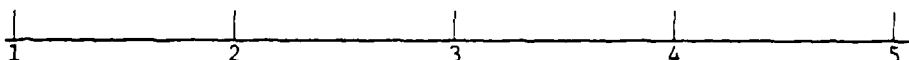


Loss ratio is totally in favor of threat forces.

Losses were balanced equally between threat and friendly forces.

Loss ratio is totally in favor of friendly battalion.

5. Rate the overall combat effectiveness of this battalion in the exercise.



Totally ineffective

Minimally adequate for mission accomplishment.

Effectiveness exceeded mission requirements.